

1 **Amendments to the Claims:** The listing of claims below replaces
2 prior versions of claims in the application:

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4 1. (previously presented): A computer rendering method comprising:
5 moving a semitransparent plane including a plurality of reflection points
6 relative to an axis; and
7 rendering an image of the plurality of reflection points at a plurality of
8 positions with respect to the axis such that each said point maps an elongated,
9 continuous image.

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11 2. (original): The computer rendering method as defined in Claim 1,
12 wherein moving the semitransparent plane including the plurality of reflection
13 points relative to the axis comprises rotating the plane about, and translating the
14 plane with respect to, the axis.

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16 3. (original): The computer rendering method as defined in Claim 1,
17 wherein moving the semitransparent plane including the plurality of the reflection
18 points relative to the axis comprises moving the plane of the reflection points
19 perpendicular with respect to the axis.

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21 4. (original): The computer rendering method as defined in Claim 3,
22 wherein moving the semitransparent plane including the plurality of the reflection
23 points perpendicular with respect to the axis further comprising rotating the plane
24 about, and translating the plane with respect to, the axis.

1 5. (original): The computer rendering method as defined in Claim 1,
2 wherein rendering the image comprises rendering a 3D model from a combination
3 of images of the plurality of reflection points at a plurality of positions with
4 respect to the axis.

5
6 6. (previously presented): The computer rendering method as defined
7 in Claim 1, wherein:

8 a plurality of control points, each being located at an intersection of two
9 axes, define a three-dimensional (3D) surface of a macrostructure;

10 moving the semitransparent plane including the plurality of reflection
11 points relative to the axis further comprises rotating and translating the plane of
12 the reflection points respectively about and along each said axis of the 3D surface
13 of the macrostructure; and

14 rendering the image of the plurality of reflection points further comprises
15 rendering a 3D model from a plurality of images of a plurality of positions of the
16 planar plurality of reflection points with respect to each said axis of the 3D surface
17 of the macrostructure.

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19 7. (original): A computer-readable media comprising computer-
20 executable instructions for performing the computer rendering method as recited
21 in Claim 1.

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23 8-26. (canceled).
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1 27. (previously presented): A computer rendering method comprising:
2 moving a plurality of voxels contained within parallel opposing planes with
3 respect to an axis that is perpendicular to the parallel opposing planes, each said
4 voxel being semitransparent and having a reflectance factor and a plurality of
5 reflection points having a density; and

6 rendering an image of the plurality of voxels at a plurality of positions with
7 respect to the axis such that at least one said point maps an elongated, continuous
8 image.

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10 28. (original): The method as defined in Claim 27, wherein moving the
11 plurality of voxels contained within parallel opposing planes with respect to the
12 axis comprises rotating the parallel opposing planes about, and translating the
13 parallel opposing planes with respect to, the axis.

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15 29. (original): The method as defined in Claim 27, wherein moving the
16 plurality of voxels contained within parallel opposing planes with respect to the
17 axis comprises moving the plurality of voxels contained within parallel opposing
18 planes perpendicular with respect to the axis.

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20 30. (original): The method as defined in Claim 29, wherein moving the
21 plurality of voxels contained within parallel opposing planes perpendicular with
22 respect to the axis further comprises rotating the plurality of voxels contained
23 within parallel opposing planes about, and translating the plurality of voxels
24 contained within parallel opposing planes with respect to, the axis.

1 31. (original): The method as defined in Claim 27, wherein:
2 rendering the image comprises rendering a 3D model from a combination
3 of images of the plurality of reflection points at a plurality of positions with
4 respect to the axis; and
5 the rendered image accounts for the interaction of each said reflectance
6 factor of each said voxel with respect to the other voxels of the plurality of voxels
7 at each said position of said plurality of positions.

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9 32. (original): The method as defined in Claim 27, wherein:
10 a plurality of control points, each being located at an intersection of two
11 axes, define a three-dimensional (3D) surface of a macrostructure;
12 moving the planar plurality of reflection points perpendicular relative to the
13 axis further comprises rotating and translating the plane of the reflection points
14 respectively about and along each said axis of the 3D surface of the
15 macrostructure; and
16 rendering the image of the plurality of reflection points further comprises
17 rendering a 3D model from a plurality of image of a plurality of positions of the
18 planar plurality of reflection points with respect to each said axis of the 3D surface
19 of the macrostructure.

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21 33. (original): The method as defined in Claim 27, wherein each of the
22 voxels has an associated opacity and voxel reflectance function (VRF).
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1 34. (original): The method as defined in Claim 33, wherein:
2 the VRF represents the brightness of a voxel viewed from direction
3 $V(\theta_v, \phi_v)$ when illuminated by a unit intensity light from direction $L(\theta_l, \phi_l)$;
4 the VRF is represented by a four-dimensional color array after
5 discretization of the four angles $\theta_l, \phi_l, \theta_v, \phi_v$;
6 θ is a longitude angle; and
7 ϕ is an altitude angle.

8
9 35. (original): The method as defined in Claim 34, wherein:
10 the discretization of the four angles $\theta_l, \phi_l, \theta_v, \phi_v$ comprises the discretization
11 into directional increments;
12 the directional increments for the longitude angle are $\theta \in [0, 2\pi]$; and
13 the directional increments of the altitude angle are $\phi_l \in [-\pi/2, \pi/2]$.

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15 36. (original): A computer-readable media comprising computer-
16 executable instructions for performing the rendering method as recited in Claim
17 27.

18 37-44. (canceled).

19
20 45. (original): A machine-readable medium having instructions stored
21 thereon for execution by a processor to perform a method for rendering knitwear,
22 the method comprising:

23 generating a parameterized surface describing a three-dimensional (3D)
24 knitwear macrostructure;
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1 determining a plurality of control points that define the parameterized
2 surface, wherein each said control point is located at an intersection of two axes;
3 applying a stitch pattern to each of the control points of the knitwear
4 skeleton to form a skeleton of the yarn stitches;
5 discretizing the skeleton of the yarn stitches into a plurality of discretized
6 yarn segments;
7 sorting the discretized yarn segments according to a viewing condition of a
8 scene including the knitwear macrostructure and a distance of a view of the scene;
9 inputting the plurality of discretized yarn segments into:
10 a geometry of the scene; and
11 a lighting condition of the scene;
12 applying a lumislice, with respect to a resolution of the distance of the view
13 of the scene and a sampling density, to each stitch of the stitch pattern of the
14 sorted discretized yarn segments by translating and rotating the lumislice
15 perpendicular to and respectively along and about each stitch of the stitch pattern
16 applied to the plurality of intersecting axes, wherein the lumislice is
17 semitransparent and is computed from a fiber distribution of a yarn cross-section;
18 and
19 rendering a synthesis of the scene including the knitwear macrostructure
20 using the sorted discretized yarn segments having the lumislice applied thereto, the
21 viewing condition of the scene, and the distance of the view of the scene.

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23 46. (original): The medium of Claim 45, wherein applying a stitch
24 pattern to each of the control points of the knitwear skeleton to form a skeleton of
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1 the yarn stitches further comprises applying a color pattern to each of the control
2 points of the knitwear skeleton to form the skeleton of the yarn stitches.

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4 47. (original): The medium of Claim 45, further comprising, before
5 applying the lumislice, computing a shadow map from the geometry of the scene
6 and the lighting condition, wherein the synthesis of the scene is rendered using the
7 computed shadow map.

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9 48. (original): The medium of Claim 45, wherein:
10 each said lumislice characterizes attributions of a cross-sectional slice of
11 yarn of the yarn stitches that is divided into voxels; and
12 each of the voxels has an associated opacity and voxel reflectance function
13 (VRF).

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15 49. (original): The medium as defined in Claim 48, wherein:
16 the VRF represents the brightness of a voxel viewed from direction
17 $V(\theta_v, \phi_v)$ when illuminated by a unit intensity light from direction $L(\theta_l, \phi_l)$;
18 the VRF is represented by a four-dimensional color array after
19 discretization of the four angles $\theta_l, \phi_l, \theta_v, \phi_v$;
20 θ is a longitude angle; and
21 ϕ is an altitude angle.

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23 50. (original): The medium as defined in Claim 49, wherein:
24 the discretization of the four angles $\theta_l, \phi_l, \theta_v, \phi_v$ comprises the discretization
25 into directional increments;

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the directional increments for the longitude angle are $\theta \in [0, 2\pi]$; and
the directional increments of the altitude angle are $\phi \in [-\pi/2, \pi/2]$.